



U.S. Department  
of Transportation  
**Federal Aviation  
Administration**

# **General Aviation Airworthiness Alerts**

**AC No. 43-16**

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**ALERT NO. 225  
APRIL 1997**

**Improve Reliability-  
Interchange Service  
Experience**

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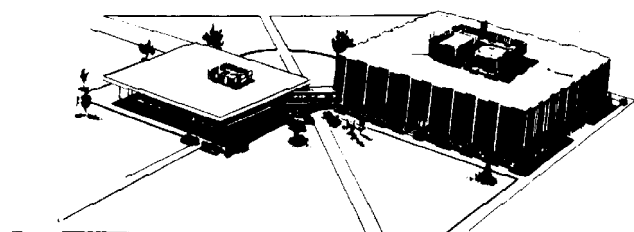
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**U.S. DEPARTMENT OF TRANSPORTATION  
FEDERAL AVIATION ADMINISTRATION  
WASHINGTON, DC 20590**

# GENERAL AVIATION AIRWORTHINESS ALERTS



**FLIGHT STANDARDS SERVICE**  
Mike Monroney Aeronautical Center

The General Aviation Airworthiness Alerts provide a common communication channel through which the aviation community can economically interchange service experience and thereby cooperate in the improvement of aeronautical product durability, reliability, and safety. This publication is prepared from information submitted by those of you who operate and maintain civil aeronautical products. The contents include items that have been reported as significant, but which have not been evaluated fully by the time the material went to press. As additional facts such as cause and corrective action are identified, the data will be published in subsequent issues of the Alerts. This procedure gives Alerts' readers prompt notice of conditions reported via Malfunction or Defect Reports. Your comments and suggestions for improvement are always welcome. Send to: FAA; ATTN: Maintenance Support (AFS-640); P.O. Box 25082; Oklahoma City, OK 73125-5029.

## AIRCRAFT

### AEROSPATIALE

**Aerospatiale  
Model TB-10  
Tobago**

**Defective Seatbelt  
Attachment  
2560**

The seatbelt attachment was found severely corroded during a scheduled inspection.

The attachment fittings on both crew seats were corroded completely through. These aluminum fittings, attached to the seatbelt webbing, attach the seatbelts (P/N Z00.N6068707220) to the airframe. It was suggested these fittings be closely inspected for damage, security, and corrosion at every opportunity.

Part total time-900 hours.

**Aerospatiale  
Model TB-20  
Trinidad**

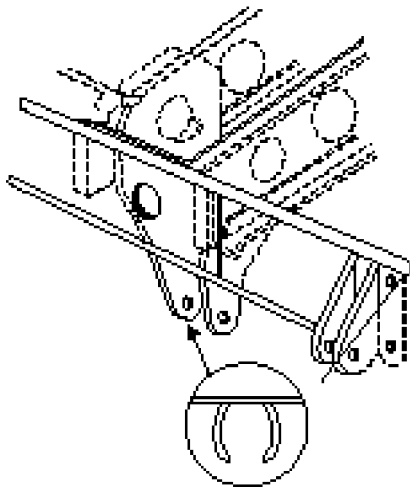
**Stabilator Attachment  
Lever  
5520**

The pilot experienced insufficient nosedown pitch control immediately after takeoff. A safe landing was made, and maintenance technicians were summoned.

An investigation of the stabilator control system disclosed the stabilator actuator attachment brackets ("lever P/N's TB10.34.006.103 and .104") were bent in a "bowed out" position. (Refer to the following illustration.) This condition effectively changed (shortened) the travel of the stabilator. The submitter speculated this damage was caused by wind gusts on the tail section of the aircraft with the flight control lock installed. It is possible this damage was caused by exhaust blast from the engine of a larger aircraft. This is a good reason to separate large aircraft from small aircraft on the parking ramp. Also, this defect may have

been discovered during a thorough preflight inspection, avoiding jeopardy of the aircraft and occupants during flight.

Part total time-956 hours.



aircraft recently received an annual inspection and was removed from air taxi operations at that time.

Many other discrepancies were found on both the right and left engines.

Time since annual inspection-42 hours.

<b>Beech Model F33A</b>	<b>Engine Throttle Malfunction 7320</b>
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The pilot reported that during cruise flight, the engine did not respond to throttle movement. A safe landing was made, and maintenance personnel were summoned.

An investigation revealed the throttle cable was “disconnected” from the fuel control arm. The attachment bolt was found broken in the engine cowling. The bolt had failed at the cotter pin hole. No cause for this defect was given.

Part total time not reported.

**BEECH**

<b>Beech Model H18</b>	<b>Engine Exhaust System Defects 7800</b>
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The pilot reported the right engine failed when induction heat was selected. This occurred during a preflight engine run. The carburetor temperature gauge indication went off the scale high.

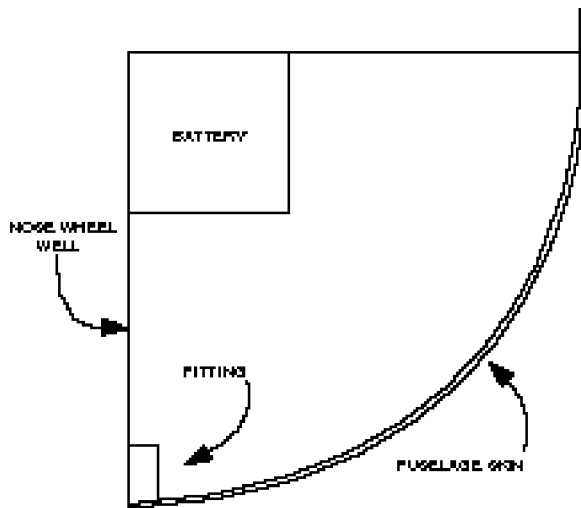
An investigation disclosed many engine exhaust system defects, and all of the defects appeared to be the result of “inadequate maintenance and inspection.” The most severe defect was a 2 inch by 4 inch hole in the outboard upper exhaust stack assembly (P/N 18-950016). The hole was adjacent to, and was believed to be the result of “an old and poor quality repair.” The stack assembly was missing several studs, and the heat duct and adapter assembly were damaged. There were particles of melted fiberglass in the induction air intake scoop and fuel injector screen. This

<b>Beech Fitting Model B58 Baron</b>	<b>Nose Landing Gear Damage 3221</b>
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The nose landing gear drag link hinge point fitting (P/N 35-400304-3) was found severely corroded and cracked during a scheduled inspection.

The fitting was corroded at the lower attachment bolt hole which was elongated and cracked. Also, the bolt was loose. The submitter speculated this damage was caused by water and condensing vapor and/or liquid discharged from the battery being trapped in this area. (Refer to the following illustration.) This damage rendered the fitting to a state of imminent failure. It is recommended this area be thoroughly inspected at every opportunity. Cleaning and corrosion treatment may be helpful in preventing reoccurrence of this defect.

Part total time-6,000 hours.



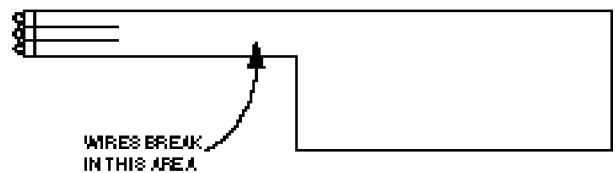
**Beech  
Model 65-A80  
Queen Air**

**Deice Boot Failure  
3060**

The propeller deice system failed during flight in icing conditions. A safe landing was made, and the aircraft was delivered to maintenance for repair.

The submitter stated this was the eighth propeller deice boot (P/N RA-1288-4) to fail in the past two weeks. In all of these cases, the wires were found broken approximately 12 inches from the terminals. (Refer to the following illustration.) The submitter stated the wires are required to bend in this area.

Part total time not reported.



**Beech  
Door Model 58  
Baron**

**Nose Landing Gear  
Malfunction  
3231**

After takeoff and retracting the landing gear, the control tower notified the pilot that the nose landing gear doors were not closed. The pilot stated the landing gear indicated "up-and-locked." The landing gear was extended manually, and an uneventful landing was made.

An investigation revealed part of the nose landing gear door retraction mechanism was broken. Specifically, the lower portion of the slotted tab near the center of the nose gear retraction pivot shaft (P/N 002-410038-1) was missing. This tab bears the required force to close the nose gear doors. The submitter suggested the manufacturer consider making the tab from more structurally substantial material.

Part total time not reported.

**Beech  
Model BE90-C90  
King Air**

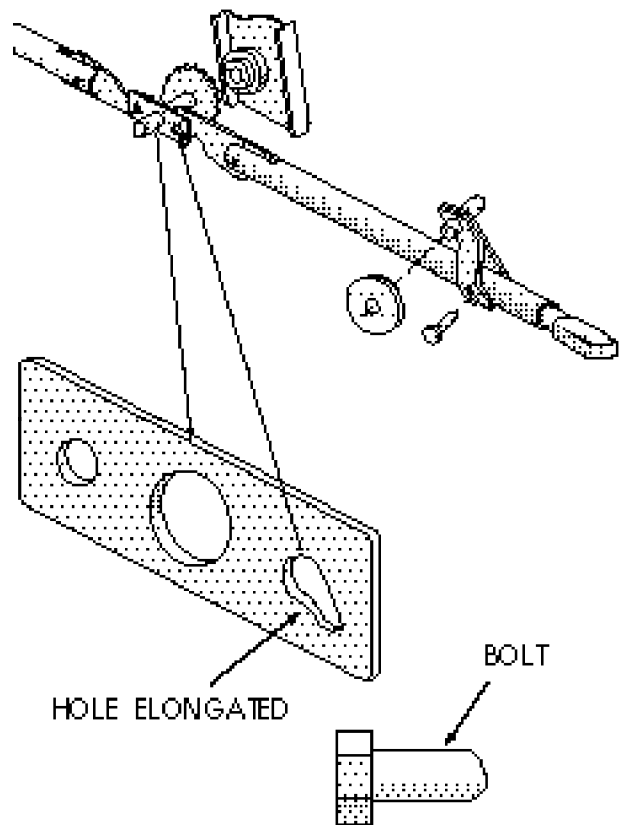
**Cabin Door  
Malfunction  
5210**

The flightcrew retired for the evening after securing the aircraft at a cross-country airport. The next morning, the cabin entrance door could not be opened.

It appeared the upper forward hook and rod link were not moving when the handle was turned. After 3 hours of trying to get the door open, a decision was made to cut the right aft cabin window to gain access to the emergency exit release handle. Entry was gained through the emergency exit, and the cabin door panels were removed. The upper "braze assembly" (P/N 50-430043-1207) attachment hole for the upper door latch link was found severely elongated, and the bolt had broken. (Refer to the following illustration.) It was suggested

the door panels be removed during scheduled inspections to allow inspection and lubrication of the mechanism.

Part total time-4,900 hours.



**Beech  
Model C-90  
King Air**

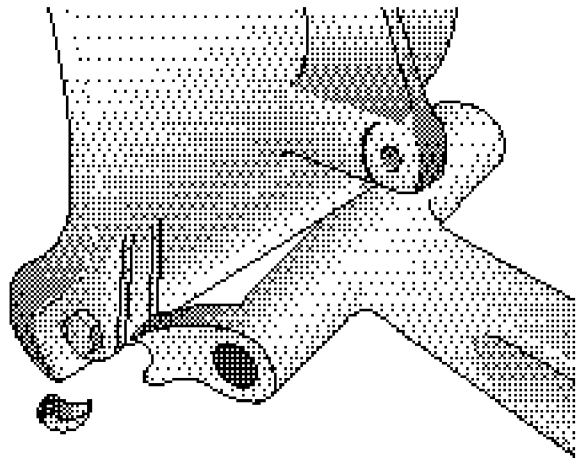
**Broken Rudder  
Pedal  
2720**

It was reported to maintenance that the pilot's side right rudder pedal was broken.

The rudder pedal arm assembly (P/N 50-524326-10) was found broken at the attachment for the rudder pedal assembly (P/N 50-524402-613) during an inspection.

(Refer to the following illustration.) All other rudder pedal attachments were inspected and found to be serviceable. The submitter speculated the bushing installed in the rudder arm assembly worked its way through the arm until the attachment hinge point failed.

Part total time-4,020 hours.



**Beech  
Model B200  
King Air**

**Air-Conditioning  
System Failure  
2110**

The flightcrew reported the air-conditioning system was inoperative.

An investigation disclosed the forward support bearing (P/N 206SZZC) on the compressor drive assembly had failed. This caused the compressor drive quill to shear rendering the unit inoperative. The submitter stated this was the third such bearing failure they had experienced. It was suspected the bearings may not be receiving adequate lubrication.

Part total time-32 hours.

**Beech**  
**Model 200**  
**King Air**

**Windscreen Failure**  
**5610**

The left pilots windscreen (P/N 101-384025-7) cracked while operating the aircraft in icing conditions at 22,000 feet altitude. Emergency procedures were followed, and a safe landing was made.

An examination of the windscreen disclosed approximately 80 cracks which appeared to have occurred instantaneously. The submitter speculated this defect was caused by an anti-ice system anomaly which caused a large temperature differential between the heating element and the windscreen. The exact cause of the excessive temperature was not given.

Part total time-2,489 hours.

**Beech**  
**Model 200**  
**King Air**

**Cabin Temperature**  
**Control Defect**  
**2160**

The pilot reported excessively warm airflow into the cabin at the floor vents and "eyeball" vents in the glareshield. The airflow temperature returned to normal after shutting off the left engine bleed air. Using left engine bleed air with the right side shut off, the temperature again became excessively warm.

Several environmental system components were changed in an effort to isolate this problem. All of these efforts failed to correct the problem. Finally, the left flow control valve (P/N 101-380013-13) was changed, and the problem was cured. The left and right engine parameters matched more closely after changing the left flow control valve. The submitter stated the flow control valve was operating normally except for the air temperature going to the cabin.

Part total time since overhaul-250 hours.

**BOEING**

**Boeing**  
**Model A75N1**  
**Stearman**

**Engine Failure**  
**2810**

The information for this article was submitted by Mr. John Cheris, an Aviation Safety Inspector with the FAA's Flight Standards District Office located in Windsor Locks, Connecticut. (This article is printed as it was received.)

The pilot reported the engine suffered erratic operation and ultimately failed. During a forced landing the aircraft nosed over, coming to rest upside down, damaging the wing, fuselage and the propeller. The pilot and passenger were not injured.

While investigating the cause of this accident, the carburetor fuel bowl was found to contain approximately 14 ounces of a fuel and water mixture. An analysis proved the water was fresh and had no saline content. While talking with the pilot, he stated that the fuel sumps were drained during preflight inspection. After further conversation it was evident the pilot was not aware that the carburetor bowl had a sump which requires draining and stated he had never drained this particular sump. It was recommended that operators and pilots be made aware of the possibility of water collecting in the carburetor fuel bowl and the necessity of draining the bowl during preflight inspections. This is a simple procedure and should not present a burden to the operators.

Part total time not reported.

**CESSNA**

**Cessna**  
**Model 140**  
**Engine Model**  
**TCM C-85-12F**

**Poor Engine**  
**Performance**  
**7414**

The pilot reported the engine performed poorly during flight.

The rotor gear was found rubbing on the distributor block housing after the left magneto (Slick) was disassembled. The distributor block housing was warped, and the bushing was worn through on the side next to the condenser. This wear had progressed into the plastic surrounding the bushing, and there was evidence of arcing along with "carbon tracking." The submitter determined that the rotor gear had not been pressed into place as required by the Slick Service Manual. The "sealing mark," which was placed on the magneto housing screws at the factory, had not been disturbed until this inspection.

Part total time-54 hours.

<b>Cessna</b>	<b>Empennage</b>
<b>Model 150A</b>	<b>Structural Cracks</b>
<b>Commuter</b>	<b>5500</b>

The aft bulkhead located at Flight Station 200.375 was found cracked at two places during an annual inspection.

These cracks were located in each corner of the bulkhead (P/N 0412175-1) between the flanges and the web. These areas are adjacent to the rudder stop bolt installations. The submitter speculated this damage was caused by windy conditions while the aircraft was parked outside without a rudder gust lock installed. It was believed the rudder slamming back and forth from one stop bolt to the other exerted excessive force in the stop bolt area. It was suggested that a rudder gust lock be installed any time the aircraft is parked outside.

Part total time-7,109 hours.

<b>Cessna</b>	<b>Seat Structural</b>
<b>Model 150F</b>	<b>Cracks</b>
<b>Commuter</b>	<b>5347</b>

Both the pilot's and copilot's seat frames were found cracked during an annual inspection.

The cracks (four each) were located in each of the vertical seat back frame tubes and were adjacent to the lower attachment point. This defect could cause the seat back to fail in an aft direction and lead to loss of control of the

aircraft. The submitter stated that if the seat back adjusting bolts are not evenly adjusted, it will allow the seat frame to twist and bend when the pilot's weight is applied. It was suggested this area be given close scrutiny during scheduled inspections. Proper inspection of this area may require partial removal of the seat upholstery.

Part total time-4,056 hours.

<b>Cessna</b>	<b>Engine Power Loss</b>
<b>Model 172N</b>	<b>7322</b>
<b>Skyhawk</b>	

A Textron Lycoming, Model O-320H2AD engine and a Precision Airmotive carburetor (P/N MA 4SPA, 10-5135) were installed on this aircraft.

The pilot reported the engine lost approximately half of its power while operating in the airport traffic pattern. A safe landing was made, and the aircraft was delivered to maintenance.

An investigation revealed the carburetor discharge tube assembly (P/N 229-164) came loose and was ingested into the engine. When this occurred, a large amount of carbon deposits were knocked loose from the interior of the engine and caused several spark plugs to foul simultaneously. The submitter stated: "It is very important to inspect the carburetor discharge nozzle assembly for security when inspecting the carburetor." This should be accomplished in accordance with the Precision Airmotive Manual.

Part total time not reported.

<b>Cessna</b>	<b>Wing Spar Cap</b>
<b>Model 175</b>	<b>Corrosion</b>
<b>Skylark</b>	<b>5711</b>

The right wing fuel tank cover panels were removed for replacement of some gaskets during an annual inspection. The wing spar cap (P/N 0523020-2), forward of the fuel tank, was found with severe intergranular corrosion.



The wing leading edge was removed for further inspection, and the same type and severity of corrosion was found along the full length of the spar cap. This corrosion damage required replacement of the spar cap. The left wing spar cap was inspected, and no corrosion damage was found. It was recommended the fuel tank access panels be removed and a rigorous corrosion inspection be accomplished at every opportunity.

Part total time-2,990 hours.

<b>Cessna Model 182K Skylane</b>	<b>Cockpit Oil Leak 7930</b>
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The pilot reported what appeared to be a puddle of engine oil on the cockpit floor.

An investigation revealed the engine oil line (P/N 0500106-292) running from the aft side of the engine firewall to the oil pressure gauge was leaking. The leak was located directly above the rudder pedals and the area was covered by an inspection panel. This defect was the result of corrosion which penetrated the wall thickness of the line. The submitter stated this area is difficult to properly inspect and therefore, receives little attention.

Part total time-4,479 hours.

<b>Cessna Model 208B Caravan</b>	<b>Wheel Brake Malfunction 3242</b>
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The pilot reported that after landing, a right turn was made using "hard" braking. When brake pedal pressure was released, the right brake remained "locked" and would not release.

Maintenance personnel were summoned and they found the right brake pressure had released. Further inspection determined the right brake master cylinder upper supply line (flexible plumbing) was collapsed at a bend radius. After removal of this line, it was found to be the incorrect part number for installation at this location. The submitter stated: "The line was factory-installed." When the correct part number line was compared to the old line,

the new one was .5 inch longer. The old line was kinked at the point where it passed around a "junction block." The submitter stated even the new longer line is not adequately long enough to eliminate the tendency of the line to collapse. Three other like aircraft were inspected and all had the incorrect part number line installed and similar stress was placed on the line.

Part total time-3,982 hours.

<b>Cessna Model 208 Caravan</b>	<b>Erroneous Engine Fire Warning 2612</b>
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The pilot was alerted by an "engine fire" annunciator alarm while taxiing to the runway for takeoff. The engine was shut down, and the passengers were safely evacuated.

Maintenance personnel arrived and could find no evidence of an engine fire. The aircraft was taken to the hangar for more testing. An inspection of the fire detection system disclosed that a portion of the fire detection loop was chafing against the engine accessory case. This allowed the loop to find an electrical ground which gave the false engine fire indication. The security and proper routing of the fire detection loop should be checked at every opportunity.

Part total time not reported.

<b>Cessna Model 210L Centurion</b>	<b>Throttle Control Cable Wear 7603</b>
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Flakes of brass were found on the throttle control cable rod-end during an annual inspection, and the throttle arm attachment had excessive free play.

Further investigation disclosed the throttle control cable attachment hole in the throttle arm (P/N 632555-31) was severely worn. This hole was worn to within .0625 inch of the edge of the arm. Complete failure of this assembly was eminent. This defect was caused by failure (during a previous installation) to install a bushing (P/N 632554-1) in accordance with the manufacturer's technical data. This allowed

the steel bolt to wear into the softer brass arm. The submitter recommended that any free play at the throttle control cable attachment to the arm be thoroughly investigated.

Part total time-500 hours.

**Cessna**  
**Model 421C**  
**Golden Eagle**

**Alternator Failure**  
**2410**

The pilot reported that during an aftertakeoff climb, the right engine alternator dropped off line. This was followed by a decrease in engine oil pressure and a rise in oil temperature. The engine was feathered, and a safe single-engine landing was made.

An investigation revealed the alternator had suffered internal failure at the drive hub assembly (P/N 646655). This caused the "red rubber" material to disintegrate and be induced into the engine oil system through the accessory drive case. The rubber material was sucked into the oil filter and the sump screen, which were completely plugged. The submitter recommended a detailed inspection of the alternator bearings, windings, and drive hub be accomplished during scheduled inspections.

Part total time-795 hours.

### CHAMPION

**Champion**  
**Model 7GCBC**  
**Citabria**

**Wing Lift Strut Defect**  
**5700**

A defect was found with the left wing forward lift strut attachment while investigating an aircraft accident. This defect was not a causal factor in the accident investigation; however, it was significant.

The fitting (P/N 20893), which attaches the left wing forward lift strut to the wing spar, was found cracked in two places. The cracks were located at the outboard end where welds were terminated. One of the cracks crossed the fitting flange and progressed approximately .375 inch vertically on the fitting web. The

other crack was contained on the fitting flange area. Airworthiness Directive (AD) 96-18-02, which deals with this subject, does not apply to this particular aircraft by serial number. Operators of like aircraft, to which AD 96-18-02 does not apply, are encouraged to inspect this area as an added safety measure.

Part total time-2,010 hours.

### MOONEY

**Mooney**  
**Model M20F**  
**Executive**

**Inoperative**  
**Emergency Fuel**  
**Pump**  
**2822**

The operator reported the emergency fuel pump (electric) was inoperative.

An inspection disclosed the emergency fuel pump (Dukes P/N 1499-00-19) had suffered internal failure. There is a stamped impression on the pump housing indicating it should be replaced every 10 years. After removing the fuel pump, it was discovered that it had been in service for approximately 23 years. The exact number of operating hours could not be determined; however, the aircraft time is given below. The submitter suggested this item be given particular attention during annual inspections.

Aircraft total time-2,665 hours.

**Mooney**  
**Model M20J**  
**Lean Machine**

**Engine Starter**  
**Failure**  
**8011**

The pilot stated that after a refueling stop during a cross-country flight, the starter failed, and the mixture control would not move.

An investigation revealed the engine starter housing attachment bolts had broken and were missing. This allowed the aft portion of the starter housing to rest on the mixture control arm of the fuel control unit. The submitter did not offer a cause for this defect. It was stated this was the second occurrence of this problem on the same aircraft experienced by the

submitter. Engine starter housing security should be given close attention during scheduled inspections and maintenance.

Part total time-34 hours.

### PIPER

<b>Piper</b>	<b>Defective Nose</b>
<b>Model PA 23-250</b>	<b>Landing Gear</b>
<b>Aztec</b>	<b>3230</b>

The pilot placed the landing gear lever in the "down" position on a landing approach, during a training flight. The nose landing gear did not indicate "down-and-locked" (no green light). The same result was obtained after cycling the gear. The nose gear appeared to be in the "down" position as verified in the gear verification mirror, and a safe landing was made.

An investigation by maintenance technicians disclosed the hydraulic powerpack (P/N 31800-002) was bypassing fluid internally. This did not allow sufficient hydraulic pressure to lock the nose gear in the "down" position. It would be a good idea to check the landing gear powerpack for internal bypassing of fluid and sufficient pressure during scheduled inspections.

Part total time-6,206 hours.

<b>Piper</b>	<b>Defective Aileron</b>
<b>Control PA 24-250</b>	<b>Cables</b>
<b>Comanche</b>	<b>2710</b>

The aileron control cables (P/N's 20943-04, 20943-02, and 14300-06) were inspected and appeared to be "rusty" where they pass through the main landing gear wheel wells.

A "rag" check indicated there were no broken cable strands. The cables were removed for further inspection in accordance with the recommendations of Advisory Circular 43.13-1A, Acceptable Methods, Techniques, and Practices-Aircraft Inspection and Repair,

and numerous broken strands were discovered. It was suggested that any corrosion (rust) be thoroughly inspected to ensure serviceability and airworthiness. Evidently, these cables had been installed as original equipment approximately 36 years ago.

Part total time not reported.

<b>Piper</b>	<b>Cracked Ribs</b>
<b>Model PA 28R180</b>	<b>5712</b>
<b>Arrow</b>	

The left and right main landing gear side brace studs were removed while complying with the requirements of Airworthiness Directive (AD) 95-20-07.

The technician cleaned the mating surfaces at the spar and rib prior to reinstalling the side stay assembly support bracket. Cracks were found in both the left and right ribs (P/N's 78475-4 and 78475-5). The cracks were located in the bend radii of the forward vertical flange and were approximately .75 inch long. This rib is not a part of the requirements of AD 95-20-07; however, 25 other reports similar to this have been received concerning this as well as other aircraft to which the AD applies.

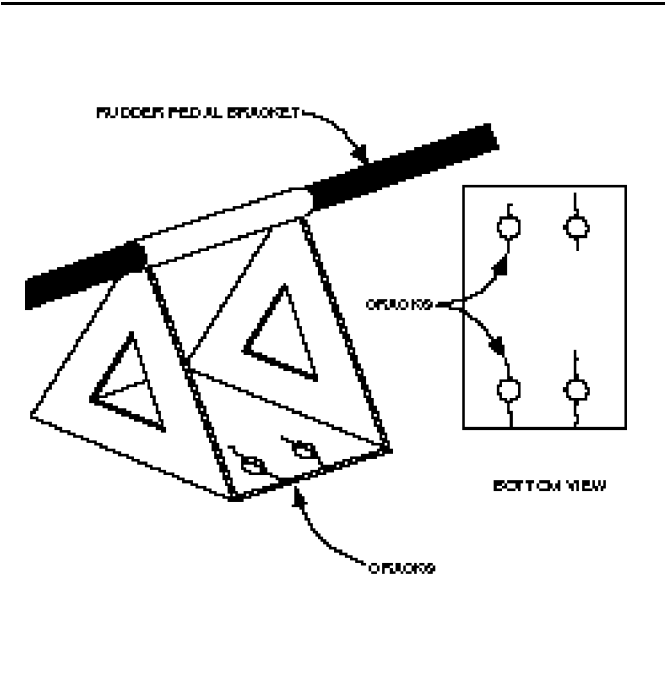
Part total time-5,137 hours.

<b>Piper</b>	<b>Rudder Pedal Bar</b>
<b>Model PA 28-180</b>	<b>Support Cracks</b>
<b>Cherokee</b>	<b>5345</b>

The center rudder bar support bracket was found cracked during an annual inspection.

The support bracket (P/N 63451-000) was cracked at each of the four bolt attachment points. (Refer to the following illustration.) The submitter speculated this damage was caused by the nose wheel shimmying and/or the design of the bracket. It was recommended that all of the rudder bar support brackets be thoroughly inspected during scheduled inspections.

Part total time-3,800 hours.



**Piper  
Model PA 30  
Twin Comanche**

**Corroded Stabilator  
Hardware  
5552**

Hardware was found severely corroded while performing maintenance on the stabilator control system.

Both of the close tolerance bolts (P/N AN175-33A) used in the stabilator torque tube horn (P/N 402-346) attachment were corroded far beyond acceptable limits. These bolts had been installed since the aircraft was new (approximately 33.5 years ago). A similar defect was found on a like aircraft. The submitter suggested the manufacturer establish a life limit for these bolts. It would be wise to inspect these bolts for corrosion and security during scheduled inspections.

Part total time-2,842 hours.

**Piper  
Model PA 32R300  
Cherokee Lance**

**Broken Nose  
Landing Gear Door  
Hinge  
3231**

A nose landing gear door malfunction was reported, and maintenance technicians found the right nose gear door hinge broken.

The piano-type hinge was attached to the engine mount with two Number 3 bolts approximately .5 inch apart. The broken hinge allowed the aft end of the right gear door to hang down and had the potential to interfere with the gear retraction and extension. The submitter stated finding this defect on other like aircraft. It was speculated that vibration causes a stress concentration in the area of this hinge, causing it to fail. Also, it is possible the door hinge was installed in a manner which induced a stress preload on this hinge point.

Part total time not reported.

**Piper  
Model PA 32R300  
Cherokee Lance**

**Difficult Engine  
Starting  
7322**

The pilot reported the aircraft engine was very difficult to start.

An inspection of the Bendix fuel servo (P/N 2524273-12) by maintenance personnel disclosed the mixture control stop screw was missing. This stop screw is used for both the "full rich" and the "idle cutoff" positions. The missing stop screw and bushing allowed uncontrolled mixture travel. This installation is normally safety wired for security. The submitter recommended the security and safety wire installation be checked during scheduled inspections.

Part time since overhaul-469 hours.

**Piper  
Model PA 32R301  
Saratoga**

**Obstructed Propeller  
Control Travel  
6120**

The pilot reported the propeller control travel seemed to be obstructed.

An inspection revealed the threaded portion of the propeller control rod-end had rubbed a "track" into the left forward baffle assembly (P/N 85565-02). The submitter stated this condition has been found on "nearly all" new like aircraft. It was recommended the

manufacturer design a support to provide proper clearance between the propeller control assembly and the baffle.

Part total time-653 hours.

**Piper  
Model PA 34-200T  
Seneca**

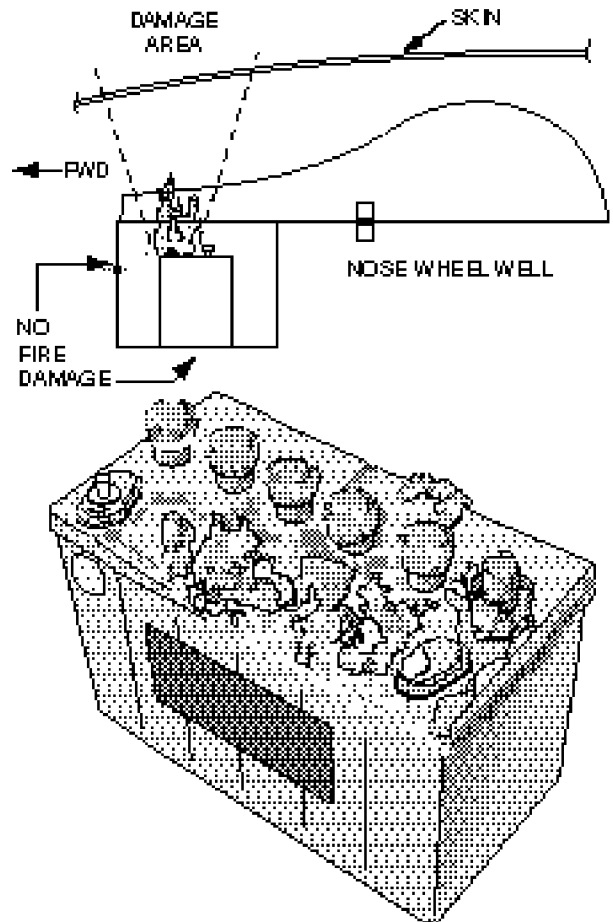
**Electrical Fire  
2432**

The pilot reported that during flight, he smelled smoke and saw a small amount of smoke in the cockpit for a brief time. No cause could be determined at the time, and all electrical systems were functioning normally. The pilot noticed after landing that the paint on the top of the nose section was scorched and "bubbled."

The nose baggage compartment was opened and soot was found covering the entire area as well as the nose wheel well. The battery cover was severely burned. The battery cover was then removed. It appeared the battery had "melted down," and a large section of the top case was burned away. (Refer to the following illustration.) Even with the top of the battery open, there was still electrolyte in the battery cells. This was a Gill, Model G-35 battery.

An investigation of the aircraft electrical system did not produce a reasonable cause for this failure. The submitter speculated the battery failed internally due to a "short" near the positive terminal.

Part total time-213 hours.



**Piper  
Model PA 46-350P  
Malibu Mirage**

**Personal Restraint  
System Failure  
2510**

The pilot's shoulder harness inertia reel failed during a forced landing. Upon impact with the instrument panel, the pilot suffered head injuries.

The inertia reel support (P/N 84859-02) broke during impact with the terrain and failed to restrain the pilot. This was a low speed impact at a relatively flat attitude. The investigators agreed the inertia reel support should have sustained the "G" forces involved. The submitter recommended the manufacturer construct the inertia reel support bracket using a design which is structurally stronger. This recommendation, along with supporting material, has been sent to the responsible FAA aircraft certification office for action. The manufacturer has made efforts to upgrade the support bracket.

Part total time not reported.

HELICOPTERS

BELL

**Bell**  
**Models 205, 205B,**  
**212, 412, and 412CF**

**Tail Rotor Yoke**  
**Bending**  
**6720**

The following article was submitted by the FAA's Rotorcraft Certification Office (ASW-170) located in Fort Worth, Texas. (This article is printed as it was received.)

Tail rotor yoke (P/N 212-011-702) (inspection of), and tail rotor flapping stop yield indicator (P/N 212-011-713-103) (installation of), and temporary Vne airspeed reductions on the 412 and 412CF models.

Bell Helicopter released OPERATIONS SAFETY NOTICES 205-96-33, 205B-96-08, 212-96-35, 412-96-21, and 412CF-96-01 on May 17, 1996, for the models listed above. Investigation of two recent accidents revealed that the tail rotor yoke had been exposed to a bending overload condition. In

one other case, the overload damage resulted from a main rotor sudden stoppage.

In the ground incident, the extent of noticeable damage was to one tail rotor blade (which was then repaired). There was no visual damage to the yoke at the time of the ground incident. The yoke was allowed to remain in service.

In the other event, the aircraft had been involved in a main rotor sudden stoppage. The tail rotor blade had been replaced during the subsequent sudden stoppage inspection, but not the tail rotor yoke.

Lab investigations revealed that both yokes had been subjected to bending loads sufficient to cause a degradation in the strength characteristics of the yoke.

Subsequent to the investigations of the yokes, Bell Helicopter has issued Alert Service Bulletins (ASB) 205-96-69, 205B-96-25, 212-96-101, 412-96-89, and 412CF-96-01, all dated 9-3-96, for 205, 205B, 212, 412, and 412CF helicopters, respectively.

NOTICE: UNTIL FULL COMPLIANCE WITH PART 2 OF ASB 412-96-89 OR ASB 412CH-96-01, ALL 412 AND 412CF HELICOPTERS ARE LIMITED TO A MAXIMUM OF 120 KNOTS INDICATED AIRSPEED (KIAS). BELL HAS ISSUED TEMPORARY ROTORCRAFT FLIGHT MANUALS FOR "TEMPORARY REVISION FOR AIRSPEED RESTRICTION," WHICH ARE FAA APPROVED. MANUAL BAT-412-FM-1 IS APPLICABLE TO AIRCRAFT S/N 33001-33107; MANUAL BAT-412-FM-2 IS APPLICABLE TO S/N 33108-33213 AND S/N 36001-36019; MANUAL BAT-412-FM-3 IS APPLICABLE TO S/N 36020-36086; MANUAL BAT-412-FM-4 IS APPLICABLE TO S/N 36087 AND SUBSEQUENT; AND

MANUAL C-12-146-000/MB-002 IS APPLICABLE TO ALL 412CF HELICOPTERS.

THE 205, 205B, AND 212 DO NOT HAVE AIRSPEED RESTRICTIONS.

In each of the above mentioned bulletins, there are four steps for compliance:

**1.** Immediately upon receipt of the bulletin, accomplish a review of all installed and spare tail rotor yoke assembly historical records to determine if they have previously been involved in any bending load into the yoke. Yoke assemblies which have an incident history as described above must be inspected immediately as described in Number 2 below. A one-time ferry flight should be authorized. Yokes which do not have an incident history as described above may continue in service as specified in Number 2 below.

**2.** Within the next 120 days following the receipt of the bulletin, and for yokes not removed from service as a result of compliance with Number 1 above, a one-time x-ray diffraction inspection of all (P/N 212-011-702-All) yoke assemblies (both installed and spare) with time since new (TSN) greater than (0) is required. This must be accomplished within 180 days following receipt of the bulletin for all yokes not affected by Number 1 above.

Also required in this part is replacement of (P/N 212-011-713-001) flapping stop with (P/N 212-011-713-103). The (P/N 323-011-713-103) has been designed as a yield indicator to provide visual verification of a yoke assembly which has been subjected to excessive bending loads. Following installation of the -103 flapping stop, a 25-hour recurring inspection (Number 3 below) for yielding is required.

**3.** This part establishes a 25-hour recurring special inspection of the flapping stop, (P/N 202-011-713-103), to determine if damaging/excessive bending loads have been sustained by the tail rotor yoke assembly.

This inspection also applies following each incident of a hard landing, sudden stoppage power on or off, or other incidents involving excessive tail rotor flapping loads. Reference the applicable alert service bulletin for details on the inspection of the loads. Reference the applicable alert service bulletin for details on the inspection of the flapping stop yield indicator.

**4.** The final part provides additional helicopter maintenance and overhaul/repair information that is to be incorporated into the maintenance and repair and overhaul manuals.

### McDONNELL DOUGLAS

**McDonnell Douglas  
Model 369D  
500D**

**Engine Noise During  
Shutdown  
7250**

Ground personnel noted a peculiar noise coming from the engine (Allison, A250-C20B) during engine startup and shutdown between 20 and 60 percent N1 RPM. The engine was reported to run normally at ground idle. The noise was similar to that of a "growl" turning to a "howl" and was mistaken for a problem with the gearbox.

Several adjustments were made to the fuel control starting schedule prior to disassembly. It was during this time that the engine tended to hang at 40 percent N1.

During disassembly of the engine, the cause of the noise was found to be excessive heat damage to the Number 1 turbine nozzle and the Number 1 turbine wheel along with subsequent damage to the remaining turbine. The submitter stated that the probable cause was from a defective fuel nozzle since no reports of a hot start had been reported.

The submitter further stated that the reason for this report was to alert maintenance personnel and pilots that a serious problem is possible if, at anytime, an unusual noise occurs

on startup and/or shutdown as described above. It is recommended that a hot section inspection be performed if any of these described noises are observed.

Part time since overhaul-1,098 hours.

<b>McDonnell Douglas Model 369D 500D</b>	<b>Fuel Bypass Switch Failed 7310</b>
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While in the performance of a logging operation, and at 20 feet of altitude, the aircraft sustained major damage due to a loss of engine power. Postinvestigation into the cause of the accident by McDonnell Douglas and the FAA revealed that the engine power loss was due to a fuel nozzle screen that became clogged, and thus collapsed. Further accident investigation revealed that the fuel filter bypass switch was not functioning properly (not closing); therefore, the pilot had no indication that the fuel filter was in bypass.

Another aircraft of the same model had a fuel nozzle screen collapse. A precautionary landing was made after the power loss, and no damage resulted to the aircraft. Again, the pilot reported that the fuel bypass light did not illuminate. Testing of this switch showed it to be inoperative at 24.5 to 35 inches of fuel.

The submitter stated that it was discovered later that there had been a possible microbial problem in the fuel with the fuel trucks that fueled these aircraft.

Part total time-633 hours on the aircraft that had the accident, and 730 hours on the aircraft that had the incident.

**ROBINSON**

<b>Robinson Model R-22 Beta</b>	<b>Cracked Yoke 6230</b>
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Half of the yoke was noted to be cracked through while conducting a preflight inspection. The submitter stated that a

low-time pilot who had flown the aircraft did not report any substantial vibration during the previous flight. Although the surrounding area had corrosion damage, it did not appear the yoke had been damaged due to this corrosion.

Part total time-1,804 hours.

**SCHWEITZER**

<b>Schweitzer Model H300C</b>	<b>Chipped Main Transmission Ring Gear 6320</b>
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The main rotor tachometer went to zero while the aircraft was being “run-up.” An inspection was performed, and maintenance personnel noted one tooth on the ring gear was chipped. Further inspection revealed the chip had jammed in the oil pump gears which in turn caused the oil pump driveshaft to shear. Schweizer Service Bulletin 244.2 addresses the problem.

Part total time-1,983 hours.

**SIKORSKY**

<b>Sikorsky Model S76A Mark II</b>	<b>Fractured Internal Oil Filter Cap 7261</b>
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The following article was submitted by the FAA’s Flight Standards District Office located in Baton Rouge, Louisiana. (This article is printed as it was received.)

The Number 1 engine (Allison, 250-C30S) fire warning light illuminated shortly after takeoff from an offshore platform in the Gulf of Mexico. It was also at this time that the Number 1 engine oil pressure began to fluctuate. The flightcrew immediately secured the Number 1 engine, at which time the fire warning light extinguished, and the aircraft was flown to the nearest airport, and a single-engine run-on landing was executed.



Examination of the engine revealed that one of the attachment ears on the engine's internal oil filter cap (P/N 6895096) had fractured, causing the engine to lose all of the oil. It was noted that the last time the oil filter had been removed was during a scheduled inspection accomplished 134 hours prior the incident.

The failure of the engine oil cap was the second occurrence of this happening to this operator.

The engine oil filter is required to be removed and inspected each 150 operating hours for this operator. It is commonly known that differential torquing is often used to seat the oil filter during installation. It is suspected that the loads placed on the filter cap mounting ears during installation, throughout the years, eventually leads to the failure of the cap.

The submitter stated that technicians installing these oil filters should closely inspect the oil filter cap for condition prior to installation and ensure that the filter is completely seated before applying torque. The submitter further stated that the Allison Maintenance Manual should be revised to contain a caution statement concerning the seating of the oil filter cap prior to applying torque.

Part total time not reported.

## AGRICULTURAL AIRCRAFT

### WEATHERLY

**Weatherly  
Model 620B**

**Structural Corrosion  
5714**

All of the wing center section fittings were found severely corroded during an annual inspection.

Pitting had not taken place; however, powdery deposits of corrosion ("rust") were observed between the lower spar cap fittings and the

spar web. These are steel fittings attached to the aluminum spar web, and the submitter stated it appeared there was no primer or protective coating between these parts. During a telephone conversation the aircraft manufacturer stated that the fittings are primed, and on newer aircraft, an epoxy finish is used. The submitter also stated that evidently this aircraft did not receive any type of corrosion protection in this area. It was recommended that all other owners of like aircraft pull the gap seals and check these fittings for proper corrosion protection.

Part total time-1,457 hours.

## AMATEUR, SPORT, AND EXPERIMENTAL AIRCRAFT

### CHALLENGER

**Challenger  
Model Velocity**

**Failed Engine  
Exhaust Manifold  
7810**

A homemade exhaust manifold broke away at the flange on the Number 1 and Number 3 cylinders. This caused extreme heat inside the engine cowling and caused ignition wiring to heat up. A rise in engine oil temperature was noted. It was also noted that the exhaust temperature was erratic. When the exhaust manifold broke, it dropped down in the engine bay and caused the aileron controls to jam.

In this situation, the pilot had to make an emergency landing to an open field. The aircraft stuck in an obstacle, and the aircraft flipped upside down. The pilot and passenger were alive; however, it took approximately 2 hours to remove them from the aircraft.

The submitter stated that caution should be taken in the construction of exhaust manifolds, or for that matter, anything being made that requires heat treatment.

Part total time not reported.

# LASER

# Laser Model 200

## Spade Arm Broken

It was noted that the “spade arm” on the trailing edge of the aileron was broken and bent aft, just above the “tig weld.” The actual spade is plate steel, .125 inch thick, and weighs 21 pounds 8 ounces. This spade acts as a counterweight for the aileron, as well as a booster for the flight controls.

Part total time not reported.

## RV-6

## RV-6

# Magneto Coil Failures

The submitter of this report stated a longstanding problem of magneto coil failures.

This particular problem involved a Slick, 4200 series magneto. The submitter stated he discussed this problem with a representative of the magneto manufacturer.

Airworthiness Directive (AD) 81-16-02 deals with this subject and refers the reader to Slick Electro, Inc., Service Bulletin (SB) 1-81. The "orange" colored potting material, used on the coil cracks. The cracks appear to emanate from the high voltage output post of the coil on the ends near the corners of the bridge or across the rear of the coil. The AD and the SB are applicable to 4200 and 6200 series magnetos. The 4200 series magneto uses part number M-3114 coil and the 6200 series magneto uses part number M-3009 coil. The coils affected were manufactured between October 1, 1978, and April 30, 1980. Please refer to the documents previously mentioned for specific applicability and text. Since these magnetos may be installed on a variety of different aircraft, both certified and experimental, you are encouraged to have the magnetos checked for possible coil defects.

The Service Difficulty Program data base contains 139 entries which were reported on coil defects in Slick magnetos.

Part total time not applicable.

# STOLP STARDUSTER

# Stolp Starduster Model SA-300

## Oil Filter Burst

### 8550

The engine oil filter (P/N CH48109) burst during engine startup.

The oil filter gasket was broken and forced out of the retaining groove. The filter case was extruded and rounded outward at both ends by internal pressure. All of the oil passages in the engine, oil cooler, and pressure relief valve were free of obstruction. The submitter speculated the oil filter bypass valve failed to operate. A pressure-test of the oil system downstream of the filter turned up no other defects which may have led to this defect. No other cause was offered.

Part total time not reported.

## PROPELLERS AND POWERPLANTS

## ENGINE OR APPLIANCE AD's?

Information for the following article was submitted by Mr. George Erdel, an Aviation Safety Inspector, with the FAA's Flight Standards District Office located in Orlando, Florida. (This article is printed as it was received.)

One of Mr. Erdel's operators brought to his attention two Airworthiness Directives (AD) which may be easily overlooked during scheduled inspections.

AD 96-12-04 applies to a piston,  
manufactured by Superior Air Parts, Inc.  
This piston is used in the Teledyne

Continental Motors (TCM) O-470 series engines which are used on numerous light single-engine, and multiengine aircraft of various makes. This AD is listed as an "APPLIANCE" AD and is not retrievable under any search of the TCM O-470 engine, or the aircraft on which these engines may be installed.

AD 96-12-22 applies to an oil filter adapter which is manufactured by Cessna Aircraft Company. This AD is used on several TCM opposed piston engines. As in the previously stated case, these engines are used by numerous manufacturers on light, medium single-engine, and multiengine aircraft. Since the AD was issued against Cessna Aircraft Company, and not TCM, this AD may easily be missed during an inspection.

Each of these AD's are correct in their content and should be complied with, as required, in the respective text of each AD.

The ambiguity of these AD's does not relieve the owner/operator and/or maintenance technician from their responsibility for compliance under the Code of Federal Regulations (CFR).

The responsible FAA aircraft certification office is aware of this problem. At this time, a corrective action has not been determined. If further information is obtained, it will be published in a future edition of this publication. This information is being published to make all aware of these AD's and their applicability.

### **PRATT & WHITNEY**

**Pratt & Whitney  
Model R-985-14B**

**Cam Failure  
8520**

This engine was installed on the left wing of a Beech Model 18, aircraft. The pilot experienced a loss of engine power and

maintained only 1,900 RPM. Manifold pressure remained constant, and a safe landing was made.

An initial inspection revealed the valves were not functioning properly. The engine nose case plug, located on the upper part of the case just aft of the thrust bearing cover plate, was removed for inspection of the cam ring. This inspection disclosed some of the rivets installed in the cam were missing and others were loose. After disassembly and removal of the cam, only 5 of the 35 cam rivets were still in place and these 5 rivets were sheared. The mating surfaces of the cam parts were severely fretted, indicating this attachment had been loose for some time prior to complete failure. The submitter recommended the nose case plug be removed, and the cam rivet installation be closely inspected while slowly turning the propeller, each 300 hours of operation or at least once each year.

Part total time-900 hours.

### **TEXTRON LYCOMING**

**Textron Lycoming  
Model TIGO-541SER**

**Counterweight  
Failure  
8520**

This engine was installed in a Piper Model PA 31P, aircraft. The oil system suction screen was removed during an engine oil change.

A piece of metal was found in the oil screen which appeared to be part of a snap ring. Further investigation revealed the snap ring (P/N 71906) section came from the aft side of the Number 5 crankshaft counterweight (P/N 75637). The remainder of the snap ring was still installed. Also, the counterweight was cracked at the bushing hole. The submitter did not offer a cause for this defect.

Part time since overhaul-641 hours.

## ACCESSORIES

### PNEUMATIC SYSTEM AIR FILTER BLOCKAGE

The submitter of this report did not state the type of aircraft on which this system was installed. The maintenance technician changed the air filter during maintenance on the pneumatic system.

The technician attempted to "blow" through the filter assembly before installing the new air filter (P/N 1J4-7) to check for obstruction and freedom of air movement. This revealed the filter would not allow airflow. The filter was disassembled, and an adhesive material (used to attach the filter element) was found blocking the hole. The submitter did not state whether the inlet, outlet, or both holes were blocked. This proves, once again, that even new parts should be closely scrutinized before installation.

- |          |   |
|----------|---|
| 97-04-13 | Mitsubishi Heavy Industries MU-2B requires removing vent check valve assembly from bulkhead between fuel tanks.                                     |
| 97-05-03 | AlliedSignal GNS-XLS or GNS-XL flight management systems requires all owners to make change in AFM or Flight Manual Supplement limitations section. |
| 97-04-04 | AlliedSignal GTCP85 APU's.  |
| 97-03-06 | Auxiliary Power International Corp. APS3200 APU's require replacement of existing electronic control box.   |
| 97-02-13 | Pratt & Whitney JFTD12A and T73 turboshaft engines require fluorescent penetrant inspections.   |

## AIR NOTES

### AIRWORTHINESS DIRECTIVES ISSUED IN FEBRUARY 1997

- |          |  |
|----------|--|
| 97-03-03 | Pilatus Britten-Norman BN-2, BN-2A, BN-2B series that do not have generator terminal diodes installed with modification NB/M/1571.   |
| 97-04-02 | Priority letter—Raytheon (Beech) 1900, 1900C, and 1900D requires installing exterior operating instruction placard for air stair door, cargo door, and emergency exits, as applicable. |
| 97-04-11 | Air Tractor AT-802 and AT-02A requires revising Airworthiness Limitations section of   |

### LIFE LIMITS

A letter was recently received from a submitter who brought up a topic which may need to be reviewed by all maintenance technicians, aircraft owners, and operators. The subject of that letter was "Life Limited Aeronautical Parts."

It is possible to overlook some parts with an established life limit, allowing them to remain in service beyond their life expectancy. Personally, I have heard many excuses for this and other types of errors of omission (e.g., second shift did it, another shop did it, etc.).

Most helicopter maintenance technicians are well acquainted with the life limit requirements of various parts. However, many fixed-wing folks rarely deal with life limits,

and this article is directed to them. Life limits established for aircraft parts are mandatory. They are listed in the Type Certificate Data Sheet (TCDS) for a particular aircraft. Some life limits are established as a requirement after the aircraft is certificated. This is usually done when the service history of a part indicates the need for a life limit. In those cases, there are more than one means of making them mandatory, the TCDS may be revised, or an Airworthiness Directive (AD) may be issued.

The "Instructions For Continued Airworthiness," contained in the manufacturer's technical data for some aircraft, will contain a section dedicated to the life limit requirements for a specific make and model. The "Product Specification," that is a part of the TCDS for some parts, may list life limit requirements. Life limits may be established as a part of an FAA-approved maintenance program, including an inspection program. They may also be included in the limitations section of an aircraft flight manual.

The responsibility for compliance with established life limit requirements remains with the "owner/operator." However, maintenance technicians, who value their customers, should endeavor to check these items, and remind the customer of these requirements. Providing complete, accurate, well organized, and neat records to your customer will go a long way in repeat business, as well as, assuring the continued good health of your customers and safety of operation.

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### ALERTS ON LINE

We have received several requests to make the information contained in AC 43-16, General Aviation Airworthiness Alerts, available electronically. Therefore, this publication is now available through the FedWorld Bulletin Board System (BBS), via the Internet.

You may directly access the FedWorld BBS at telephone number (703) 321-3339. To access this publication through the Internet, use the following address.

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Beginning July 1996, we are using the Adobe Acrobat software program format to upload this monthly publication. This change is necessary to include the illustrations which are associated with various articles. The file names will still begin with "ALT", followed by three characters for the month, followed by two digits for the year; however, the extension will be "PDF" (e.g. "ALTJUL96.PDF"). The extension "PDF" indicates it will be necessary to download the files for viewing. The Adobe Acrobat Viewer is available for download from the Internet (free of charge) and will allow the files to be read.

You may still access the "TXT" extension for issues of this publication prior to July 1996.

Also, available at this address are the Service Difficulty Reports which may be of interest.

The Regulatory Support Division (AFS-600) has established a "HomePage" on the Internet, through which the same information is available. The address for the AFS-600 "HomePage" is:

<http://www.mmac.jccbi.gov/afs/afs600>

Also, this address has a large quantity of other information available. There are "hot buttons" to take you to other locations and sites where FAA Flight Standards Service information is available. If you have any questions, our "E-mail" address follows.

Other requests have been received indicating a need to make the staff of this publication more available to our readers. To provide greater and more flexible access for you to offer information and ask questions, you may contact us by using any of the following methods.

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We hope this will allow you to contact us by a means which will be convenient and save some of your time. We welcome the submission of aircraft maintenance information via any form or format. This publication provides an opportunity for you to inform the general aviation community of the problems you have encountered. The Service Difficulty Reporting (SDR) program also brings the problems to the attention of those who are able to resolve the problems. Your participation in the SDR program is vital so accurate maintenance information is available to the general aviation community.

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For your convenience, FAA Form 8010-4, Malfunction or Defect Report, will be printed in every issue of this publication.

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3. <b>POWERPLANT</b>						
4. <b>PROPELLER</b>						
5. SPECIFIC PART (of component) CAUSING TROUBLE						
Part Name	MFG. Model or Part No.	Serial No.	Part/Defect Location			
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Comp/Appl Name	Manufacturer	Model or Part No.	Serial Number			
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